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SPACE GATEWAY SUPPORT (SGS) **SGS-13 36 00.00 99 (April 2006)**

Preparing Activity: SGS-DE **Superseding**
SGS-13146J (February 2005)

SGS GUIDE SPECIFICATIONS

References are NOT in Agreement with UMRL dated 01 April 2006

Revised throughout - changes not indicated by CHG tags
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Section 13 36 00.00 99

TOWERS
04/06

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NOTE: This guide specification covers the requirements for the detail fabrication and erection of radar towers..

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.
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PART 1 GENERAL

1.1 RELATED DOCUMENTS

Division 1 Specification Section.

1.1.1 Manufacturer's Specification Standards and Product Data

Copperweld Corporation and Alumoweld Company, Specification ER-3008 Alumoweld Type M Strand for guy and messenger.

Alumoweld Product Catalog; Duncan South Carolina.

Preformed Line Products Catalog for the Tower/Antenna Industry; Cleveland, Ohio.

Rohn Commercial Products Catalog, Peoria, Illinois.

Cortec Corporation Corrosion Inhibitor Coatings Catalog, St. Paul, Minnesota.

Antenna Products, Inc., Mineral Wells, Texas.

1.1.1.1 Codes and Standards

Comply with applicable provisions of ANSI/EIA/TIA-222-F.

1.2 SUMMARY

This Section includes the following:

a. Guy cables.

b. Preform-Dead-Ends.

c. Safety-climb-fall-protection system.

d. Use of stabilization jig assemblies on tower structures.

e. Corrosion inhibitor coatings to fasteners and connection hardware.

1.3 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy, Air Force, and NASA projects.

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The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES in sufficient detail to show full compliance with the specification:

1.3.1 Detailed Product Data

For the following:

a. Guy cables

b. Fall-protection systems and ladders.

c. Pre-form dead-ends, thimbles, shackles, turnbuckles, wire rope clips, etc.Corrosion inhibitors, etc.

1.3.2 Shop Drawings

Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

Provide templates for anchors and bolts specified for installation under other Sections.

1.3.3 Samples for Verification

For each type and finish of extruded nosing and tread.

1.3.4 Mill Certificates

Signed by manufacturers certifying that products furnished comply with requirements for:

a. Guy cables and hardware.

b. Ladders and safety systems.

1.3.5 Tower Structure Stabilization Plan

Detailed plan signed and sealed by a Professional Engineer registered in Florida with:

a. Structural engineering calculations,

b. Jig fabrication drawings that specify in clear detail the size, dimension, location, material, and method of connection of all components,

c. Procedure for erecting and moving stabilizing jig,

e. Procedure for installing tower structural members,

f. Procedure for installing guy cables showing required tensioning.

Report of final measurements of tension to each guy cable.

Report of final survey data measurements for tower alignment at each guy cable attachment level.

1.4 QUALITY ASSURANCE

1.4.1 Contractor Qualifications

Firm must be experienced in tower repair and modifications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to complete required job without delaying the work.

1.5 PROJECT CONDITIONS

1.5.1 Field Measurements

Verify dimensions by field measurements before repair or modification and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.5.2 Established Dimensions

Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.6 RESPONSIBILITY FOR ERRORS

The Contractor shall be responsible for all errors of installation and correct fitting of structural members.

1.7 STORAGE AND HANDLING

Store all material out of contact with the ground and vegetation in such manner and location as will minimize deterioration. Cover with waterproof membrane. Use wood blocking between all members to prevent damage to coating systems. Handle all material with pads and fabric slings to prevent damage to coating system.

PART 2 PRODUCTS

2.1 GUY CABLES

Guy cables with a minimum breaking strength of 25,000 pounds, or less, shall be Alumoweld Type M strand for guy and messenger, or approved equal, in accordance with Copperweld and Alumoweld Specification ER-3008.

Guy cables with a minimum breaking strength greater than 25,000 pounds shall be equal to or better than, Alumoweld wire and strand (decimal strand), or approved equal, in accordance with ASTM B416.

2.2 TEMPORARY GUY CABLES

Temporary guy cables shall be equal to, or better than, the requirements for "2.1 Guy Cables" of this specification or ASTM A475 Extra-high Strength Grade with Class A coating.

2.3 PREFORM DEAD END

Guy cable ends shall be connected using preforms equal to, or better than, Big-Grip Dead-End Preformed Line Products.

Preforms shall be fabricated of same material and be coated with same material as guy cable being connected.

2.4 COATINGS AND CORROSION INHIBITOR

2.4.1 Galvanized Coating

Where specified, use after fabrication hot dip galvanized zinc coat in accordance with ASTM A123.

2.4.2 Galvanizing Repair Paint

High-zinc-dust-content paint for regalvanizing, complying with SSPC-Paint 20.

Corrosion inhibitor shall be VCI-368 manufactured by Cortec Corporation.

2.5 FALL PROTECTION SAFETY CLIMB RAIL

2.5.1 General

Furnish and install complete OSHA approved fall protection rigid safety climb rail system.

Aluminum T-rail system by Antenna Products Corp., Mineral Wells, TX, or approved equal. T-rail systems shall be ASTM B221, 6061-T6 with 0.25 in. by 2.0-in. flange. Due to use of standardized fall-protection skates (safety sleeve) at CCAS, substitutions will not be allowed that are not compatible with antenna products safety sleeve number 1000-0829-401.

2.6 TENSIOMETER

Instrument used to measure guy cable tension shall be deflection-type tensiometer, Model Number TMM 750, with attachment saddle for small diameter cables, manufactured by Penn-Tech International, Inc., West Chester, Pennsylvania, or approved equal.

2.7 EQUIPMENT

All equipment, such as, but not limited to, come-a-longs, winches, cranes, dynamometers, slings, survey instruments, etc., shall have all required certifications, tags and documentation and shall be suitable for intended use.

Documentation of certifications and load tests must match identifying tags on equipment.

2.8 SALVABLE MATERIALS

All materials removed from towers shall be removed from site, securely bundled, and turned in as salvable materials as directed.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

Tolerances for erection and adjustment, tower alignment, guy tension,etc., shall be in accordance with ANSI/EIA/TIA-222-F Structural Tower Standard. Guy cable tensions shall be measured with calibrated tension meter instrument. Tower alignment shall be measured with accurate survey instruments. Report final measurement of guy cable tensions and tower alignment.

All structural components in guy cable assemblies shall have minimum breaking strength equal to, or greater than, breaking strength of guy cable.

Maintain works in safe and stable condition during erection and adjustment. Provide temporary bracing, fabricated stabilizing jigs, and shoring, as

required and remove when final connections, bracing and guys are completed. Erection, repair, and adjustment of towers shall only be accomplished with personnel experienced in this specialized type of construction that are working under competent supervision. All required construction and safety equipment shall be on-site and in good condition. Work shall only be performed in acceptable weather conditions. All final assemblies shall be secured with lock nuts, cotter pins, and/or safety wires to prevent connections or hardware from coming loose.

Comply with National Association of Tower Erectors (NATE) industry standard for the safe use of gin poles as amended on February 6, 1998, and published in Tower Times, Vol. 4, No. 3, March, 1998.

3.2 COATINGS

Except for aluminum coated guy wire, aluminum coated preforms, and stainless steel safety climb wire, all steel materials, fasteners, hardware, etc., shall be hot-dip zinc coated after fabrication in accordance with ASTM A123 or ASTM A153.

Galvanized steel shall not be cut, reamed, welded, drilled, or modified in field.

After installation, erection, and all adjustments are complete:

a. Inspect all new connections for tight fit of all plies and for installation of lock nuts, lock washers or peened threads.

b. Clean all new fastener heads, nuts, washers, and exposed threads; and touch-up paint with galvanized repair paint.

c. Clean all areas of galvanized coating that have been damaged or abraded, and touch-up paint with galvanizing repair paint to comply with ASTM A780.

d. After touch-up painting has been completed and cured, coat all new and existing fasteners, thimbles, turnbuckles, shackles, clamps, eyebolts, tie wire, and other hardware with Cortec VCI-368 corrosion inhibitor.

3.2.1 Dissimilar Metals

Coat all aluminum, brass, stainless steel, etc., surfaces that will come in contact with grout, concrete, masonry, wood, carbon steel, or other dissimilar metals with a heavy coat of bituminous paint.

3.3 ADJUSTING AND CLEANING

3.3.1 Touchup Painting

Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

3.1.1 Galvanized Surfaces

Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.4 TOLERANCES FOR ERECTION AND ADJUSTMENT FOR TOWER ALIGNMENT

Guy cable tension, tower height, etc. shall be in accordance with ANSI/EIA/TIA-222-F Tower Standard.

Guy cable tensions shall be measured with calibrated tensiometer instrument. Tower adjustment load test shall be measured with accurate instruments.

Report final measurements of guy cables tensions and tower alignment.

All structural components in guy cable assemblies shall have minimum breaking strength equal to, or greater than, breaking strength of guy cable.

-- End of Section --